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# Antioxidant and antidiabetic effects of flavonoids: A structure-activity relationship based study (Article)

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## Abstract

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The best described pharmacological property of flavonoids is their capacity to act as potent antioxidant that has been reported to play an important role in the alleviation of diabetes mellitus. Flavonoids biochemical properties are structure dependent; however, they are yet to be thoroughly understood. Hence, the main aim of this work was to investigate the antioxidant and antidiabetic properties of some structurally related flavonoids to identify key positions responsible, their correlation, and the effect of methylation and acetylation on the same properties. Antioxidant potential was evaluated through dot blot, 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging, $ABTS^+$ radical scavenging, ferric reducing antioxidant power (FRAP), and xanthine oxidase inhibitory (XOI) assays. Antidiabetic effect was investigated through α-glucosidase and dipeptidyl peptidase-4 (DPP-4) assays. Results showed that the total number and the configuration of hydroxyl groups played an important role in regulating antioxidant and antidiabetic properties in scavenging DPPH radical, $ABTS^+$ radical, and FRAP assays and improved both α-glucosidase and DPP-4 activities. Presence of C-2-C-3 double bond and C-4 ketonic group are two essential structural features in the bioactivity of flavonoids especially for antidiabetic property. Methylation and acetylation of hydroxyl groups were found to diminish the in vitro antioxidant and antidiabetic properties of the flavonoids. © 2017 Murni Nazira Sarian et al.

## Indexed keywords

EMTREE drug terms: alpha glucosidase, ascorbic acid, dipeptidyl peptidase IV, flavonoid, hydroxyl group, ketone, plant extract, sitagliptin, Tetracera indica extract, Tetracera scandens extract, unclassified drug, xanthine oxidase inhibitor

EMTREE medical terms: ABTS radical scavenging assay, acetylation, antidiabetic activity, antioxidant activity, Article, chemical bond, controlled study, DPPH radical scavenging assay, drug screening, enzyme assay, enzyme inhibition assay, ferric reducing antioxidant power assay, IC50, in vitro study, medicinal plant, methylation, nonhuman, plant leaf, structure activity relation, Tetracera indica, Tetracera scandens

## Chemicals and CAS Registry Numbers:

alpha glucosidase, 9001-42-7; ascorbic acid, 134-03-2, 15421-15-5, 50-81-7; dipeptidyl peptidase IV, 54249-88-6; sitagliptin, 486460-32-6, 654671-78-0, 654671-77-9

## Manufacturers:

Drug manufacturer:

Sigma Aldrich, Singapore

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